THE BRITISH JOURNAL

OF

OPHTHALMOLOGY

JANUARY, 1921

COMMUNICATIONS

SOME CASES OF ENCEPHALITIS LETHARGICA

BY

JAMES TAYLOR, C.B.E., M.D., F.R.C.P.

PHYSICIAN TO THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, *QUEEN SQUARE*; CONSULTING PHYSICIAN TO MOORFIELDS EYE HOSPITAL.

THE cases which I am about to relate are, I think, of peculiar interest to ophthalmic surgeons. No doubt many cases have recently been erroneously regarded as cases of encephalitis lethargica, but, I think, although there is only clinical evidence in those I am about to relate, that there is little doubt that they are to be regarded as belonging to this category, and as diplopia or ptosis, or both these conditions, have been amongst the earliest symptoms complained of, and as some of them have in the first instance come under the observation of ophthalmic surgeons, they cannot fail to be of some interest to the readers of this journal.

1.—*I saw, on August 20, 1919,* at the instance of Sir James Cantlie, a young man of 28, who had been wounded—not seriously—*in the knee in 1915.* He was sent to Southampton, and was in hospital there for five weeks. He then went to his home in Hertfordshire on leave, and returned to the army depôt at Hertford. From there he went to Windsor, and thence was sent to Ireland. He was transferred to the Air Force on account of his mechanical skill. Late in 1918 and early in 1919 he had an illness in Ireland. It was called "Rheumatism," and was characterised

by feverishness, sleeplessness, and headache, which lasted a few days. He then became very drowsy, and had diplopia. He was discharged from the army in April, 1919.

When seen in August of that year he complained that he was easily tired, and could only do a very short day's work. He slept well, but his appetite was poor, and he sweated much, even without exertion. There was no sign of visceral disease. He then looked very stiff, and had all the aspect of paralysis agitans without tremor. There was no diplopia, no nystagmus, and his reflexes were normal. When seen in September, 1920, his condition was unaltered, except that the rigidity was perhaps not quite so marked.

2.—The next case is that of a soldier, aged 25, admitted to Queen Square on August 12, 1920, complaining of stiffness, tremor, dribbling of saliva, and difficulty in speaking and swallowing. His history is rather curious, and not very clear. He was in the army, and was wounded several times between 1915 and 1917: left arm, left leg, and right shoulder, but not severely. In November, 1917, he had a gun-shot wound of the head, left parieto-occipital region. He was unconscious for several hours, and was in bed for seven weeks. At first, on recovering consciousness, he had headache and giddiness, and this was increased when he began to walk. There was gradual improvement, and from February to June, 1918, he was able to be on light duty. In June he was passed "fit for service," and sent to Chatham. Then the headache got worse, and he had difficulty in writing and in other acts requiring fine hand movements, e.g., buttoning, and his speech was altered. He was sent into hospital at Chatham on July 4th, and on the 10th his head was operated upon for depressed fracture. The headache and dizziness were relieved after the operation, but he dribbled, his right hand was weak, and his right leg dragged in walking. Some improvement took place in the next few months, but while still in hospital, in November, 1918, he had an attack of "influenza." His temperature went up to 102° F.; he was very drowsy, and he had diplopia which has persisted. He is unable to say whether this was present before the operation. About July, 1919, his arms became more awkward and shaky, the dribbling more troublesome, and his face stiff. There is no real incontinence of urine, no change in reflexes, and the diplopia is especially troublesome in looking down. He sleeps badly, and groans in his sleep. Coughing is difficult, apparently because of the rigidity, and the whole aspect is that of a severe case of paralysis agitans.

In this case, if the history is correct, it is impossible to associate the condition with the feverish attack with drowsiness and diplopia in November, 1918, as many of the symptoms were present before, dating from about the time of the operation, but the latter aspect of the case is very suggestive.

3.—E. B., female, aged 39 years, two children healthy, no direct or suggestive evidence in her condition of specific disease, although the Wassermann was mildly positive. There was much worry before her present illness began, and there is a somewhat unconvincing story from the patient of an accidental escape of gas and consequent gas poisoning, before the onset of symptoms. Three weeks before her admission on March 25, 1918, she had diplopia and double ptosis. She was seen at Moorfields by Mr. Fisher who referred her to me, and she was admitted to Queen Square. On admission she seemed very feeble, both eyes were almost closed, the right lids were swollen and the right cornea was anaesthetic. The pupils reacted normally and there was nystagmus to right and left. There was double ptosis, divergence of the left eye, and weakness of all eye movements. All the movements of the head and limbs could be carried out, but the patient tired rapidly, her walk was stiff and her expression rigid and mask-like. All the reflexes were normal.

This patient gradually improved, but when last seen there was still great rigidity, although movements could be carried out fairly well and there still persisted divergence of the left eye.

4.—Case diagnosed as disseminated sclerosis.

A young married woman admitted under my care at Queen Square on account of diplopia with the diagnosis of "early disseminated sclerosis." No abnormality was present except slight nystagmus and some general weakness. All the reflexes were normal and this, of course, excluded disseminated sclerosis. The history was significant. A few weeks before admission she became ill—very drowsy, but could be roused to take food. After partaking of food she at once went to sleep. There was no history of delirium. The sleepiness had passed off before her admission and the diplopia gradually ceased to trouble her. A little nystagmoid jerking was still present when she left the hospital. I cannot but think that this was a mild case of encephalitis lethargica.

5.—Another case was seen in private—a young healthy man of 35 years of age who had been overworked for a long time. Diplopia was the first trouble in his case, and when I first saw him he had obvious weakness of one sixth nerve, an observation confirmed by the ophthalmic surgeon with whom I saw him. He had been sleeping badly. I advised him to go to bed at once and he did so. At first his sleep was not good, then it became abnormally sound and prolonged. There was a rise in temperature and slight delirium. He gradually improved and ultimately became quite well. I think this was certainly a case of the same nature.

6.—The next case is that of a doctor in private practice. On Christmas night, 1918, he had a violent attack of diarrhoea and vomiting. He had not felt well that day, and had eaten sparingly.

After recovering from this he never felt really well again, had various vague pains, thought to be rheumatic, and sensations as if his head were being drawn downward and forward. He had diplopia for several weeks before actually going to bed, and had also bluish mists before his eyes. He engaged a *locum tenens* apparently about January 20, and went to bed. The following day he was practically comatose, and had no recollection for several days after this. I saw him on February 25 with Dr. Randall, Wimbledon. He was then partially conscious, with double ptosis and defective eye movements. He gradually improved, and in two months was at work. I saw him about a year later. He had continued at work and was able to carry on without much difficulty. No defective ocular movements were present, but he complained of stiffness, and his aspect was that of a patient with slight paralysis agitans without tremor. He has continued to improve steadily.

These cases, in which the affection was not severe—numbers 4 and 5—are, I think, of peculiar interest, for the symptoms were comparatively slight and the recovery was practically complete. The other cases are more marked, evidently the result of a more severe intoxication, but in all of them the eye symptoms were distinct and in some of the cases striking.

A CASE OF MELANOSARCOMA CONJUNCTIVAE BULBI

BY

L. K. WOLFF, OCULIST BACTERIOLOGIST, FIRST ASSISTANT OF THE LABORATORY OF HYGIENE OF THE AMSTERDAM UNIVERSITY,

and

DR. H. T. DEELMAN, DIRECTOR OF THE LABORATORY OF THE ANTONI VAN LEEUWENHOEKHOUSE (NETHERLAND INSTITUTE FOR CANCER RESEARCH).

ALTHOUGH melanosarcoma of the interior of the eye is not very rare, similar tumours of the exterior are only exceptionally met with. As the latter tumours show considerable differences in their clinical progress when contrasted with the former, we consider that an elaborate account of the history of such a tumour should prove of value, especially as some general conclusions may be drawn from our account.

Our patient was born in 1881, and first came under observation in the autumn of 1916. She had noticed a small black spot the size of a pin's head on the left conjunctiva during the last ten years, and thought that it had become a little bigger in the last few years. Very recently a small red blister had appeared, and it was on account of this that she sought medical assistance. The patient has always been healthy and has had five healthy

children. She is a brunette with dark hair, brown eyes, and dark complexion. She has many small moles on the body, as also have her sisters and her children. The report of the condition of the left eye is as follows: On the conjunctiva bulbi at the side of the cornea there is a small half round tumour. The surface is irregular and shining and about half the tumour is pigmented. It is only loosely attached to the subconjunctival tissue. There is a superficial stripe of pigment surrounding the tumour. The vessels supplying the tumour are tortuous and swollen (Fig. 1).

The question was, what to do with this case? Seeing that these tumours tend to recur locally after they have been radically removed (a point which we shall discuss later), the removal of the

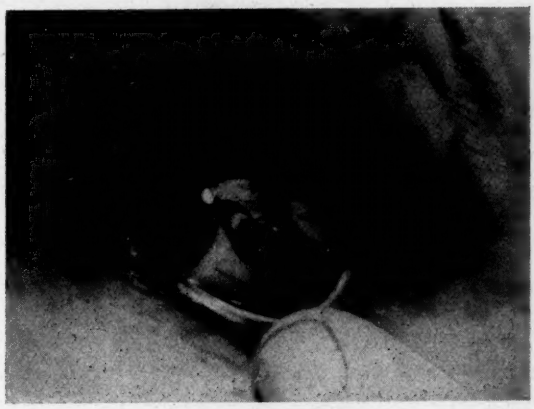

FIG. 1.

whole eye had to be considered, a very serious thing for a woman of thirty-five, especially as the functions of the eye were absolutely normal. Since in recent years X ray therapy has proved of some value in such cases, we decided to remove the tumour alone and subsequently to expose the eye to this treatment, as we knew from Axenfeld's account that such exposure was not likely to injure the eye. We, therefore, removed the tumour with a wide strip of conjunctiva.

The anatomical examination of the tumour showed that macroscopically we have to do with a granular piece of tissue which is irregularly coloured black and brown; microscopically it appears to be covered on three sides with pavement epithelium. Under the epithelium there is a tumour tissue which reaches the surface in several places. Where this is the case the epithelium has become very thin. Especially in the deeper parts of the tumour

the structure is markedly alveolar. The protoplasm of the cells, under higher magnification, is often indistinct, sometimes granular and sometimes frothy. The nuclei are often spindle-shaped. Where the alveolar structure becomes apparent the cells are often spindle-shaped. The situation of the pigment is of importance. This pigment is mainly found as granules of varying size lying in the stroma of the connective tissue between the formed cell alveoli. When *in* the alveoli it is generally to be found in the most external cells. In addition, irregularly outlined dark coloured cells are to be seen in small vessels (blood or lymph vessels). Since these are tumour cells that have extended beyond the section into the lumen, the vascular wall must have been

FIG. 2.

broken through. In other places where the external limitations of the formed cell groups consist of a flat layer of cells, it is impossible to decide whether we are dealing with a tumour adhesion which has been cut through vertically, or with divided vessels filled with tumour cells. Nuclear divisions are not very numerous, but are easily found. The microscopical diagnosis was: melano-sarcoma (type, melanosarcoma alveolare). The preparations did not enable us to ascertain if the removal had been radical or not.

The subsequent history is as follows: the wound healed well in a few weeks, leaving the conjuuctiva slightly oedematous and light rose coloured. The operation wound was then exposed to a rather strong X ray treatment (in total 16 H. units were given, filtration 5 mm. aluminium). A few months later the condition is as follows: there is a small stripe of pigment which ends horizontally in the place where the tumour had been. This stripe of pigment

lies in a part which looks as if it might be scar tissue, and extends from the edge of the cornea some way on to the bulbar conjunctiva. After the first series of exposures no further X ray treatment was given. The patient attended regularly for inspection, and no change was noted during the rest of 1916 and the whole of 1917 till December. The attending physician thought that at that time there had been some increase in the width of the pigment stripe. In March, 1918, there was no doubt of this, as, with the aid of magnification, the pigment could be seen to have extended into the cornea, which had not been previously observed. The photograph (Fig. 2) shows the condition of the eye.

The problem of treatment now became a difficult one. There was no question of a tumour in the clinical sense of the word, and the intact condition of the corneal epithelium spoke against a tumour relapse. The eye performed its functions normally, and

FIG. 3.

gave no trouble. Had we to do with a simple melanosis, possibly due to the X ray exposure, or a remains of tumour pigment, or was there a question of a tumour itself? After ample discussion we decided to remove the eye, because clinically it could *not* be said which of the two processes we had to deal with, and because, with this doubt, it was safer for the patient to think the worst. A prolonged X ray exposure was rejected, because the effect could not be controlled. The eye was removed in May, 1918. Recovery was uneventful, and the patient was subsequently fitted with an artificial eye. The condition of the eye after removal is better understood from Fig. 3 (after a drawing) than from any verbal description. Magnification shows that the peculiar pigmentation extends further than is represented in the drawing.

Macroscopical examination shows no other abnormalities, and there are no over-filled blood-vessels as in the tumour that was first removed. The surface of the pigmented parts is smooth and shining. Horizontal sections were made through the pigmented part after imbedding in celloidin. Microscopically there appears to be a pigment focus in and under the epithelium. The greatest

extension is at the corneo-scleral junction (Fig. 4). Here we find a focus of cells which under low magnification is specially conspicuous when compared with the cornea and sclera which are poorly supplied with cells but rich in fibrous tissue. Under high magnification some parts are seen to possess numerous capillary vessels, the spaces between which are filled up with irregularly formed pigment cells, mostly large and elongated. There are also many mononuclear and several plasma cells. The pigment cells are found directly under and in the epithelium, and also massed together in cavities at the expense of the epithelium. Locally the

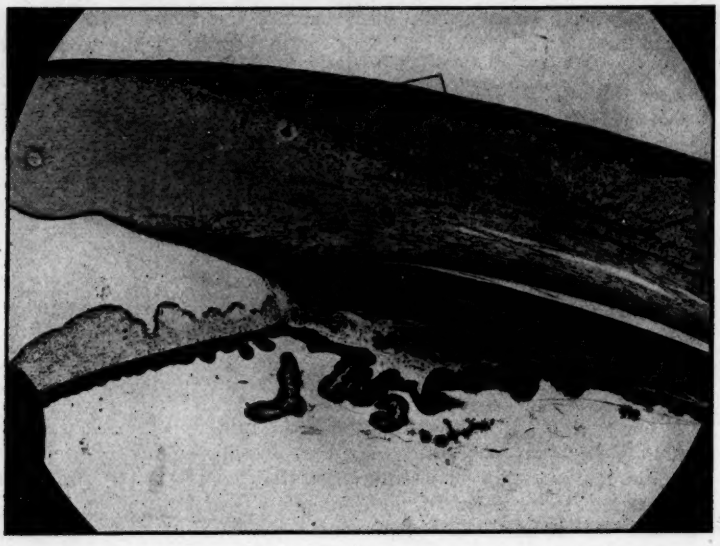

FIG. 4.

epithelium becomes very thin, and in some places it has disappeared entirely, to be replaced on the surface by a group of pigment cells. We do not feel able to decide that these spots may not have been artificially produced by removal of epithelium at the operation. Fluorescein never showed any staining. In the deeper layers of the focus of pigment cells we can see distinctly how the cells tend to arrange themselves along the course of the vessels (Fig. 5, from a drawing after a microphotograph). There is no distinct rupture of the vessels, but there is obliteration from the pressure of the cells. It is also noteworthy that some irregularly situated leucocytes are found in the lumen of the vessels. The pigment cells penetrate into the epithelium of the cornea and conjunctiva,

and extend a considerable distance from the main focus. In the corneal epithelium they extend up to the line of dots as represented in Fig. 3. We also find pigment cells scattered here and there in the sclera. The fibres of the sclera, situated directly under the pigment focus, show a winding course.

What is the condition here, melanosis or tumour? We do not hesitate to decide upon the second. The infiltrating growth in the

FIG. 5.

epithelium, the destruction of the epithelium, the vessel growth under the epithelium, and the arrangement of the cells along the vessels, show that we have to do here with a tumour relapse. Thus the removal of the eye is justified by the microscopical examination, since the deep pigment focus would have been out of reach of radical treatment.

The subsequent history of the case was as follows: in the autumn of 1919, rather more than a year after the removal of the eye, the patient returned with a tumour in the temple, near the

left eye. This was removed by an arched incision close to the orbit. The temporal muscle was cut through and partly removed. Healing was uneventful.

Pathological examination of the removed tissue shows an irregularly shaped mass, as large as a cherry, the surface of which is mostly formed of fat with a piece of muscle. Inside a harder mass can be felt. On the deeper side there is a sharply outlined greyish-white and rather hard tumour mass. Microscopical examination shows that the structure of this tumour corresponds with that of the tumour first removed, with this difference, that only a minimum amount of pigment can be found in the second growth after prolonged search.

Summary. We have the presence of a spot of pigment on the conjunctiva of the left eye for a considerable period. This suddenly begins to grow rapidly and is removed. X ray treatment follows the removal. In spite of the use of a powerful series of exposures recurrence takes place a year later in the situation of the original pigment spot. The eye is then removed. At a considerably later period a metastasis appears in the neighbourhood, almost free from pigment and easily removable. After the last operation the patient remains in good health.

Remarks. If we read the literature of these tumours we find that, in spite of their rarity, there is a certain amount of uniformity in the clinical process. The melanosarcomata of the interior of the eye are considered to be very malignant tumours, as evidenced from the appearance of widespread metastases even when the primary tumour has been removed soon after its discovery (liver metastases, general melanosis). The following condensed account from the literature of the subject illustrates the clinical course of melanosarcoma of the exterior of the eye.

Lagrange[1] recorded in 1901 twenty-three cases, taken from the literature, among which are two of his own. This shows the rarity of these cases. The extraocular tumours do not display the same malignant course as the intraocular variety. Although metastases do occur, such occurrence usually takes place at a later period and only in certain regions. On the other hand local recurrence after removal is frequent.

The limbus is considered a site of predilection for these tumours, especially the portion lying between the lids. They also, though very rarely, occur in other parts (bulbar conjunctiva, caruncle). Heller[3] gives an account of the localization. He gathered 80 cases from the literature and found, that, in so far as he could trace the seat, 37 cases originated from the limbus, 17 from other parts of the conjunctiva, 7 from the caruncle, and 1 from the sclera.

All statements agree that the growth is a very slow one. The tendency is for the tumours to grow outwards, and the patients

usually seek advice on account of difficulty in closing and opening the eyes.

Relapse is frequently recorded after local removal. In many cases the patients say that formerly there had been a pigment spot in the situation of the tumour which suddenly developed in that situation (in the 80 cases quoted by Heller, this pigment spot existed no less than 36 times). Wolfrum[4] examined the bulbar conjunctiva of normal eyes for the presence of pigment and found that it was of more frequent occurrence than a superficial examination would have led him to expect. Especially along the limbus pigment seemed to occur when looked for with sufficient magnification. Since the origin of these tumours may take place from these microscopic pigment spots as easily as from the larger, macroscopic, ones, it is not improbable that all these tumours start from conjunctival pigment; the patient, however, may not know of any previous pigment spot in the case where such spot was very minute.

In the cases recorded by Degering, Green, Erwing, and Sickerer a pigment spot at the site of the tumour had existed since youth. In another case a naevus had existed for ten years before the tumour. This was the case of a man of 22 who had a small yellow, slightly raised tumour on the eye for three or four years. It measured about 4 mm. by 2 mm., and was situated on the external side of the eye close to the limbus, in exactly the same place as the growth dealt with in this paper. It was transparent, and on the upper side a little stripe of brown pigment was visible. Some vessels led up to it and could also be recognized in the substance of the tumour. It had not grown and had caused no trouble. It was said to have followed inflammation of the eye (conjunctivitis ?). Two years later the condition was still the same. Three and a half years later the only change noted was the development of what looked like a local arcus senilis at the place where the growth touched the cornea. This was barely 1 mm. wide, and seemed to have grown gradually a little wider. On this account the tumour was removed, under local anaesthesia, six and a quarter years after the first consultation, and ten years after it was first noticed. Healing was uneventful. Microscopically the epithelial layer was intact, under which there was a sharply outlined tumour mass, consisting mainly of larger and smaller groups of cells that were often of a light colour, and rich in protoplasm. The formed tumour alveoli were often very distinctly outlined, although there were also parts of the tumour more definitely sarcomatous in construction; at least there the stroma disappeared entirely, and the alveolar structure ceased. Again in places the structure resembled that of an endothelioma, with unattached cells arranged like an irregular tube. Here and there a small pigment focus existed (iron-free pigment), where more pointed and spindle-shaped cells, loaded with pigment,

remained in the stroma, and where there was also granular pigment in the epithelioid cells.

Such cases strongly suggest the origin of melanosarcomata from pigmented naevi. The irregularly polymorphous structure of the melanosarcomata, the irregular pigmentation, etc., all look so much like the structure observed in a naevus that, involuntarily, we come to the conclusion that only very slight changes are necessary for a sarcoma to develop from a naevus.

For the time being, the problem of the origin of these tumours cannot be solved. As to the melanosarcomata, this question corresponds to that of the origin of the construction elements of the pigment naevi. So long as the schools of Unna and Ribbert do not agree about the origin of the naevus cells as they appear in the superficial cutaneous layers in moles, we think it is of little use to discuss the origin of the melanosarcomata in detail here. One can, however, imagine cases which have to be examined by a pathologist-anatomist, especially of the forepart of the eye, which could be of great importance for the solution of this question. For these tumours *can* be quickly diagnosed, and so we may expect here that even the very smallest tumours are brought for inspection (the varying sarcomatous and alveolar construction of these tumours make the solution of the question of origin, epithelium or mesenchyma, all the more difficult).

There have been many attempts to prove that these tumours originate from the pigment tumours of the conjunctiva bulbi and from the naevi.

Wolfrum made a study of this question, and he thinks he may infer from his slides that the naevus cells grow directly downwards from the epithelium cells. The reverse, however, viz., that the naevus cells come from below and attach themselves to the epithelium, may be deduced from his illustrations as well. Frick[5] is right in indicating that Wolfrum's study has not made us much wiser as to this question. So the question of the origin of the melanosarcomata remains unsolved for the melanosarcomata of the conjunctiva bulbi, as well as for the origin of naevi of this organ or of all other organs.

Especially as regards the beginning of the growth, traumata have been thought to play a rôle. The superficial origin and the situation between the eyelids are used as arguments in favour of this theory. The patients frequently come with the complaint that something has got in the eye, after which the tumour began to grow. Lowenthal[6] mentions in 1894 that among the small number of tumours which were described at that time, trauma appeared in the history of these swellings five times. Nevertheless, we read that both macroscopic and microscopic pigment spots frequently occur in the same part. Wolfrum

points out that the pigment of the limbus and its surroundings especially occurs within reach of the opening between the lids—so the connection between trauma and the formation of tumours in this place a priori becomes less likely.

Finally, it is important to notice that the growth always develops towards the outside. A growth towards the inside of the eye seems to be very rare in these tumours. The growth then passes along the perforating anterior ciliary vessels. In one case sarcomatous cells were found in the canal of Schlemm (Parsons [7]). As to the latter, it is the real carcinomata which seem to disregard the anatomical borders. Carcinomata of the conjunctiva bulbi more frequently grow towards the inner eye, destroying the coats of the eye (de Vries[8]).

Besides, we were also struck by the descriptions in the literature saying that the metastases of these tumours are free from pigment.

Summarizing, we have here a case of a very rarely occurring form of melanosarcoma, which, however, as to its course is "typical," by which we mean:

1. Origin from a pigment spot.
2. Growth to the outside.
3. Relapse.
4. Slow metastasis.

The case has taught us that we may have to deal with a tumour relapse even when the clinical picture cannot be recognized as such. Then the physician is confronted with the difficult question of how to act. In such cases he will have to anticipate the worst danger and remove the eye. So in such a case we must not stop at local therapeutics, but remove the entire eye at once. The X ray therapeutics on which we had founded our hope had left us in the lurch here. But the X ray treatment has not done any harm to the eye. Clinically and microscopically we did not find any change that may be attributed to the exposures. This is of importance because it has appeared from the literature (which was not yet known in 1916) that the glioma eyes of Axenfeld all became cataractous; most probably the way of exposing to X rays in the Leeuwenhoekhouse was more careful, as some of Axenfeld's cases became cataractous within a period of one to one and a half years.

LITERATURE.

1. **Lagrange**, "Tumeurs de l'oeil," 1920.
2. **Graefe-Saemisch**, "Handbuch der Augenheilkunde," Vol. V., 1904.
3. **Heller, O.**, Diss. Heidelberg. 1914.
4. **Wolfrum**, *Arch. f. Ophthal.*, Vol. LXXI, v. 11.
5. **Frick, E.**, Diss. Königsberg, 1914.
6. **Löwenthal, C.**, "Ueber die traumatische Entstehung der Geschwülste," München, 1894.
7. **Parsons, J. H.**, "The Pathology of the Eye," London, 1904.
8. **De Vries**, *Ned. Tijdschrift voor Geneeskunde*, 1902, Vol. I.

INJURIES TO THE EYES OF CHILDREN

BY

LESLIE BUCHANAN, M.D.,

SURGEON, THE GLASGOW EYE INFIRMARY.

WHILST injuries to the eyes of children do not differ greatly from those of adults, they are of special importance from more than one point of view.

The increasing frequency of such injuries, as seen in this hospital at all events, shows that the subject must be of interest both in the practical and in the economic aspect. The statistics in the following table form the foundation of this paper.

TABLE I.

CASES.	1917.	1918.	1919.
New cases	26,937	26,126	25,562
Eyes excised on account of injury	102	86	112
Children's eyes excised on account of injury ...	14	22	25
Proportion of children's eyes to total new cases ...	1 in 1,945	1 in 1,187	1 in 1,022

TABLE II.

Causes of injury to children's eyes necessitating removal, three years, 1917-18-19.

*Stones (thrown)	21
Glass (thrown)	10
Exploding cartridges and caps	5
Iron wire	5
Tin cans	5
Pen knives	4
Fork (loosening a boot lace)	2
Scissors	2
Kick of a horse	1
Door key	1
Button hook	1
Thorn	1
Airgun pellet	1
Steel spring	1
Pencil (in school)...	1
Total ...	61
Of these, primary excision in	42
,, attempt to save in	19

* In only two cases was an eye lost as the result of an injury by glass from broken spectacles, and, as these were both caused by a direct blow from a stone, the eye would certainly have been destroyed even if spectacles had not been worn.

As will be seen from the statement of causes of injury, the majority are preventible. They are only too frequently the result of a display of temper, or of carelessness in playing or being permitted to play with dangerous articles.

If it be accepted that only 50 per cent. of seriously injured eyes are excised, we have before us the loss of probably 120 eyes for the period under review, or 40 per annum. This surely equals and may even exceed the loss of eyes resulting from ophthalmia neonatorum.

Probably some may say that as these children are collected from a population of nearly two millions, the annual proportion (1 in 50,000) is not excessive, but as the vast majority of such accidents are the result of lack of proper controlling influence, and also, as they nearly all occur in families of persons engaged in industrial pursuits, the loss is far too great and is of economic importance. It is probable that the proportion of children's accidents quoted above is not much different in Glasgow from that found in other large cities, and in this event there is a distinct call for greater parental and even police supervision.

Results of injuries

Of this there is not much to say. The great majority of the eyes excised have been so hopelessly damaged that excision has been primary, i.e., within a week.

Nearly all the injuries by stones and glass thrown have been what may be described as smashes of the eye. The cornea and sclera have been cut open, forming a very extensive wound, in some cases as much as 35 mm. in total (stretched out) extent. In such cases the iris, lens, vitreous, and even the retina, have been extruded.

In many cases the lids have been cut and deep cicatrices formed, which give rise to difficult prothesis.

In two cases the orbital margin was broken, once by a stone and once by a kick from a horse.

Amongst the injuries of less severity, there is frequently a penetrating wound, as by a piece of iron wire, a pen-knife or a fork, which results in cyclitis of quiet type. These are the most difficult cases to deal with as the eye often does well for a month or two, and then sympathetic ophthalmitis steals on one unawares when the child has left the hospital.

Parsons has drawn attention to the fact that young children are fully as liable to sympathetic ophthalmitis as are adults (*Trans. Ophth. Soc.*, 1916, p. 77), and even states that they are much more liable, and I entirely agree with his conclusion.

Generally speaking, it is much wiser to err on the safe side and remove any child's eye which is injured in the ciliary region

than to try to save it and so risk the onset of sympathetic ophthalmitis. If the cornea only be cut, even though the iris be involved in the wound, it may be possible to save the eye, sightless it may be, but if the wound be continued into the ciliary region to any extent, the result is nearly always disappointing.

Injuries by glass are always more serious than they appear to be, and if the globe be penetrated by glass, it is practically always lost.

Such injuries as result from penetration by the prong of a fork, by a pen-knife, by a thorn, etc., are almost certain to result in sympathetic ophthalmitis if excision be not carried out promptly.

I agree with Parsons (*loc. cit.*, p. 76) that injuries to the lens in children give rise, in many cases, to more serious results than do similar injuries in adults. Cyclitis more frequently supervenes, and it is possible that the greater activity of the tissues may account for this fact. When the lens swells and presses forwards into the anterior chamber all may go well, but in many cases the lens tissue seems to become the seat of a low form of inflammatory action which leads to iridocyclitis.

Several years ago, I drew attention to the occurrence of optic papillitis in cases of penetrating injuries (Internat. Cong. of Ophth., 1904, p. B 21), and it is to be noted that this is quite as frequently seen in the case of children as it is in adults. It may be that the condition is merely an oedema in consequence of prolonged low tension, but more probably it is due to the presence in the vitreous body of a toxin, possibly a cytotoxin.

Sometimes, fortunately, quite astonishing results are obtained in cases of injury by sharp instruments (when clean), and it is a fairly safe rule that the surgeon may leave an eye alone, even if the cornea is extensively injured, provided the anterior chamber is re-formed in twenty-four hours.

Economic results

If the loss of the eye of an adult may be said to be loss of value of approximately £200, then the loss of a child's eye must surely be greater, as the handicap is to be of longer duration.

Whilst, as against this, it may be said that the child who loses an eye learns more quickly than does the adult to minimize the loss, by adapting himself to the defect, there are some ways in which the child is always at a disadvantage. The sense of space is never the same, and certain types of work are practically impossible for a one-eyed individual, because an adult who has lost an eye has his previous experience to aid him in correctly judging spacial dimensions, whereas a child has not.

Again, a very important point, a child who loses an eye has only one eye with which to encounter, thenceforward, the difficulties

and dangers of life, and a very simple accident may place this individual in permanent darkness at a very youthful age.

Thus, although it may not be possible to estimate the loss to the State involved in the three years' record before us, the figure must be very considerable.

Lastly, it may be noted that the loss of an eye in a child involves a considerable amount of expense in providing artificial eyes.

Cosmetic results

The removal of an eye of a young child is a very serious and unpleasant undertaking for a surgeon. In a girl, especially, it is to be regretted as the deformity which results is a consideration of some importance. About 20 per cent. of the eyes removed have been from girls.

Ernest Thomson has shown, by his experiments on rabbits (*Trans. Ophthal. Soc.*, Vol. XXI, p. 258), that the size of the orbit depends on the growth of its contents. There is no doubt that the removal of the eye of a young child gives rise to considerable deformity of the osseous framework of the face.

Treatment

In very severe cases where the eye is manifestly hopelessly destroyed, there is usually no difficulty in knowing what it is best to do. It is in the cases where an attempt may be made to save the eye that difficulties arise.

Generally speaking, the less the eye is touched the better.

If the wound is of less than six hours' duration and the anterior chamber is still open, prolapsed iris may be trimmed away, lens matter may be drawn off, etc., but if the anterior chamber be closed, to cut away a prolapse of iris may expose the eye to a second risk of infection, by allowing a portion of infected tissue to return into the eye.

A well applied compress and a bandage covering both eyes, so as to ensure complete rest, will usually do all that can safely be done in the first instance.

The value of the proceeding known as the " conjunctival flap " is open to doubt from the point of view of asepsis. As the flap cannot be sealed down all round, since it will not adhere to the corneal surface, a pocket is formed which may be a safe harbour for organisms which would have been washed away by tear formation under other circumstances. In the case of purely scleral wounds, of course, the proceeding is quite sound.

After considerable experience, I have come to the conclusion that the use of sub-conjunctival injections of bicyanide of mercury, etc., is of little avail and am convinced that the results are as good without as with them.

Atropin or eserin may be used as the requirements of the case

indicate, but if the anterior chamber is closed and a prolapse of iris exists, there is but small hope of drawing the iris away from the cornea.

I must confess that I have a strong preference for the use of atropin in all cases and often make use of solutions of 2 per cent. strength.

In later stages of a case, if the lens be pressing forwards and giving rise to hypertony, the question of surgical intervention must be considered, but usually, unless the eye remains fairly quiet, it is better not to draw off the lens, as if the eye is in a state of iridocyclitis, to open it is usually found to give rise to further irritation.

Such seriously injured eyes should be very carefully watched for at least three months and the first sign of reduced tension should be the signal for immediate excision.

In conclusion, I would express my conviction that a double bandage is of great importance both from the point of view of rest and in order to prevent the occurrence of squint at a later date.

RETINITIS PUNCTATA ALBESCENS

BY

DR. JAMES J. HEALY,

LLANELLY.

WHILE ophthalmic surgeon, I/C Army Ophthalmic Centre 79, I saw a case of this rare disease. The appended notes may be of interest.

July, 1918.—Driver H., A.S.C., aged 23 years, two years' service, was sent for examination owing to his inability to drive a motor vehicle at dusk.

Personal history.—From earliest recollections he had difficulty in seeing in a failing light, a disability which had increased since he joined the army. He also suffered from congenital deafness. On October 24, 1917, he contracted syphilis, and had a course of mercury and salvarsan, which finished December, 1917. Medical history sheet showed Wasserman reaction negative on June 13, 1918.

Family history.—His mother and a younger brother suffered from defective vision with symptoms similar to himself. These symptoms, he understood, were displayed by several other members of his mother's family. His father and several other brothers and sisters had very good vision.

Examination.—V.R. and V.L., 6/12. In a darkened room he frequently fell over obstacles, and found his way about by groping. Field of vision contracted in each eye, extending to 70° on temporal side and 30° on nasal side, contour regular. Fields of colour vision contracted and interlacing. There were no signs of

To illustrate Dr. James J. Healy's paper on "Retinitis Punctata Albescens."

external ocular disease, the media were clear. Fundus examination showed hundreds of whitish, yellow opaque spots, up to 1½mm. diameter, lying apparently in the deeper layers of the retina or in the lamina vitrea. The spots were most numerous in the equatorial zone, fading towards the periphery, absent from the macular area, and more numerous again in the immediate vicinity of the disc. The retinal vessels crossed the spots, which lay superficial to the choroidal vessels. The fundus was markedly tessellated. Migratory pigment formed four or five branched collections along the veins in the equatorial zone. The retinal vessels were slightly narrowed; the disc had a dirty, greyish tint; no evident cupping. Both fundi were equally affected and presented similar pictures.

Hearing tests.—Conversation three feet; whisper and watch not heard; high tones lost. Bone and air conduction markedly diminished; bone more so than air. Galvanic and rotary vertigo tests indicated diminished labyrinthine sensibility. Apparently a case of partial nerve deafness. I had this patient under observation for six months, during which there was no change in vision, field of vision, or night blindness.

In this patient the disease shows a resemblance to some early cases of retinitis pigmentosa, both in symptoms and also to some extent in the fundus picture. The tessellated fundus, the narrowing of the arteries, and the appearance of the disc are sometimes seen in the latter disease, and in a few instances whitish-yellow spots in a similar position are to be noted. It is possible that the two diseases have a similar pathological basis.

In retinitis punctata the pigment is abnormally deficient, migration being thus limited, and the disease in the deeper layers being rendered more prominent. It is probable that the pathological process underlying the two diseases is a perivascular degeneration of the choroidal end vessels, with atrophy of the highly developed cells and replacement by fibrous, hyaline, or fatty elements. The nutrition of the overlying retina suffers as a consequence; the nervous elements undergo partial reduction by degeneration, resulting in slight atrophy of the optic nerve and symptoms of a retina less sensitive to light and colour. The slight degeneration of the retinal arteries is probably due to less demand for their services by the retina.

I have the patient's address (near Wrexham) in my possession, in case anyone near that neighbourhood is interested.

It is only by keeping in touch with such a patient that we can ever hope to get a pathological report.

The water colour sketch gives a good impression of the character and distribution of the spots.

ANNOTATIONS

A Higher Diploma in Ophthalmology

The recent establishment of the Diploma in Ophthalmic Medicine and Surgery by the Conjoint Board of the Royal College of Physicians and Surgeons does not meet the need for a higher diploma in Ophthalmology. From one point of view, indeed, it accentuates the need; for the D.O.M. and S. is of the nature of a "pass" qualification, and if it is allowed to stand alone may come to be regarded as a criterion of a higher standard of knowledge and efficiency than it really represents. What is still required is a higher grade examination which will give reliable evidence that a successful candidate is well equipped to hold the post of ophthalmic surgeon at a general hospital. The usual criterion for ophthalmic surgeons to a hospital is the possession of the F.R.C.S.Eng., but this gives no evidence of special qualification in ophthalmology. In addition to the ordinary requirements of a registrable medical qualification, the candidate for the post of ophthalmic surgeon should have (1) such knowledge of the principles of surgery and pathology as is demanded of the general surgeon; (2) a special knowledge of the anatomy aud physiology of the eye and of those structures which are in physiological and surgical relation to the eye; (3) a sound knowledge of the optics of the eye and of those instruments which are employed for the diagnosis and treatment of ocular disorders; (4) a special knowledge of ophthalmic surgery and medicine.

It will be noted that a high level of knowledge of general surgery and pathology is put at the head of the requirements and it would be lamentable if any concession were made upon this point. The standard hitherto has been that of the F.R.C.S.Eng., and such it should remain. At the same time it must be freely admitted that it is illogical and unnecessary to demand an extensive knowledge of the regional surgery of other parts of the body from a man who is definitely embarked upon a career as an ophthalmic surgeon. His time can be much better occupied in other directions.

The other requirements mentioned will be universally admitted, but there may be some difference of opinion as to the relative rôles to be allotted to surgery and medicine. In the past ophthalmology has generally been regarded as essentially surgical, and so far as hospital and private practice is concerned this view is justified. At the same time it is imperative that the medical aspect should receive adequate attention.

It is eminently desirable that the traditions which have hitherto held sway in England should be maintained. It follows that the higher diploma in ophthalmology should be granted either by the

Royal College of Surgeons or by the Conjoint Board of the Royal College of Physicians and Royal College of Surgeons. The first suggestion is more in keeping with tradition than the second, and it would not be a difficult task to devise a modification of the fellowship examination which would meet all the requirements. If such an F.R.C.S. in Ophthalmology were instituted it would retain all the high reputation of the present F.R.C.S., and would soon become the recognized qualification for the ophthalmic post on a hospital staff.

The Pennsylvania University Graduate School of Ophthalmology

ON October 1st of this year the University of Pennsylvania, which gave a preliminary course in Ophthalmology in 1919, entered upon its first year of the full course of instruction. The Graduate School of Medicine is the outcome of the taking over by the University of Pennsylvania of the Medico-Chirurgical College and the Philadelphia Polyclinic, the latter institution having been for many years devoted to graduate teaching.

It will be seen that these recommendations are in complete accordance with those made by the British Council of Ophthalmologists. (*B.J.O.*, December, 1919, p. 558.)

Two courses are offered. First, a ten months' course, eight months of which are devoted to graduated systematic teaching by laboratory work, didactic and clinical lectures, demonstrations, clinical work, operative clinics and conferences, and two months devoted to purely clinical work. At the end of the course examinations will be held, and the successful candidates will be given certificates of attendance, or will be permitted to enter upon a second year of work as candidates for a degree.

The second year is devoted to advanced studies, practical clinical work as clinical assistants to the departmental chiefs, and to research work.

The classes are limited to sixteen students and are sectioned so as to admit of personal supervision and instruction by each of the chiefs of the departments.

The Ophthalmological Staff consists of Dr. George Crampton, in charge of the Physiologic Optics and Refraction; Dr. L. Webster Fox, Surgical Clinics; Dr. Thomas B. Holloway, External Diseases and Neuro-Ophthalmology; Dr. Luther C. Peter, Ocular Muscles and Perimetry; Dr. William T. Shoemaker, Surgery of the Eye; and Dr. William Zentmayer, Ophthalmoscopy and Medical Ophthalmology. The Department of Pathology and Bacteriology is under the supervision of Dr. John Kolmer.

In addition to the Ophthalmological Staff there are other departmental heads and assistants, totalling in all about forty instructors. This large corps of teachers enables the School to offer to the students a most comprehensive course in which the fundamentals of Ophthalmology as well as the relation of Ophthalmology to allied branches of medicine are largely emphasized.

The Registration of Sight-Testing Opticians

An interesting contribution to the perennial question of the registration of sight-testing opticians was made in the presidential address given by Dr. A. L. Kenny, of Melbourne, before the Section of Ophthalmology at the Australasian Medical Congress, recently held in Brisbane. The claims of opticians for Government registration are urged upon laymen, many of whom have obtained satisfactory reading glasses from opticians. They are accordingly in favour of the last-named. To argue before these men that opticians are not competent to test and to correct sight, because of their want of knowledge of the anatomy, physiology, and pathology of the eye, is to court an adverse verdict, since such of the opticians as have obtained the highest diplomas of the British Optical Association and similar bodies are in a position to produce sets of examination questions that would convince laymen that "such studies enter into the equipment of examination of candidates for these higher diplomas." The preliminary education and the training, general and special, of the candidates, it is true, cannot bear comparison with those of the medical student, if investigated by medical men, but under ordinary circumstances it would be impossible to persuade lay enquirers that the difference is so great as it really is. Dr. Kenny agrees that it is as impossible to prevent opticians from acting as sight-testers, as it is to suppress "counter prescribing" in the case of chemists. We must, however, never cease to oppose by all means in our power the Government of any State registering opticians as sight-testers, and in that way certifying to the public that these men are competent to test sight and to prescribe glasses. The fact that the bodies which issue diplomas to opticians forbid the use of drugs to paralyse accommodation, proves that the diplomâtes are not competent, for in many cases a test under cycloplegia shows a result different from that obtained by any subjective method of examination. Hence it is quite unjustifiable for any Government to certify to the public that a man who is forbidden by his diploma (and in the case of Queensland by the State law) to use cycloplegics is competent to test sight and to prescribe suitably. It is not

suggested that the anatomy, physiology, and pathology demanded from the optician would satisfy the requirements of medical examiners, or that the number of opticians who possess that knowledge is large, but Dr. Kenny thinks that in this controversy we should meet and defeat the opticians on the highest plane. The general claim would then of necessity fail. Ophthalmologists in the State of Victoria have been able to induce various Governments to refrain from introducing a bill for sight-testing opticians. The opticians have recently prepared a draft bill and submitted it to the Committee of the Eye Section of the Victorian Branch of the British Medical Association by whom it has been carefully considered, and as a consequence a draft of the views of the Committee has been sent to the opticians. Among other suggestions is one "that sight-testing should not be referred to in the bill and should not form part of the curriculum." Dr. Kenny, however, evidently thinks this clause unworkable, and suggests that the way to meet the difficulty is for ophthalmologists to train themselves by special university and medical school courses to practise refraction work more thoroughly and more accurately than the most skilled "optologist" or "optometrist." "The public will soon recognize the higher class of work and the increased demand will call for an increased supply of highly-skilled ophthalmologists, which will in turn make void the contention of the opticians that the public must of necessity go to them, since there are not sufficient ophthalmologists to attend to them."

After Dr. Kenny had delivered his address, the Section agreed that it would assist the opticians in any efforts made to ensure a better education in their craft, but refused to have anything to do with the legal recognition of sight-testing on the part of people who had not received a medical education, a decision endorsed by the Congress as a whole.

ABSTRACTS

I.—CATARACT EXTRACTION BY SUCTION

(1) **Barraquer y Barraquer, Ignacio (Barcelona).—A review of modern methods of cataract extraction. (Critique des méthodes modernes d'extraction de la cataracte.)** *La Clin. Ophtal.*, April, 1920.

(1) On page 580 of the BRITISH JOURNAL OF OPHTHALMOLOGY for 1918 will be found a short account in abstract of the suction method of removal of the lens in its capsule devised by

Barraquer. The reviewer was at the time impressed with the principle of the method, then called phakodialysis and now re-christened phakoerisis, and is not surprised to learn that the author has persevered with his work until he has completed 1,000 cases of cataract extraction in this way. The first part of the paper at present under consideration deals very much with the commonplace. It is when we come to the method of extraction of the lens in its capsule that the interest commences. Nineteen very beautiful photographic reproductions, selected from a cinematograph film, illustrate the author's operation from the commencement of the section to the double bandage and give one an excellent conception of the whole technique. One gathers that Barraquer met with various difficulties at the commencement, and it is greatly to his credit that he nevertheless persevered in the perfection of a method which, at the worst, seems to compare favourably with any other method of extraction in the capsule, and at the best may rival in successful results the ordinary method with cystotomy. For example, in 1,000 operations there were seven hernias of the vitreous, four ruptures of the capsule, three dislocations of the lens, two infections, and seven iris hernias. The following were the visual acuities obtained:—

Between 0.7 and 1	694	that is 69.4	per cent.
„ 0.3 and 0.7	240	„ 24.0	„
„ 0.0 and 0.3	63	„ 6.3	„
No vision	3	„ 0.3	„

When dealing with the article referred to in the opening line of this abstract the reviewer considered that the exact detail of the suction apparatus was not essential, since, as soon as the operation came into vogue, there would certainly be modifications of the apparatus. But when a surgeon has so perfected his apparatus that he has been able to compass 1,000 operations with it, the detail of the apparatus would be quite welcome. Unfortunately there is no such detail in the present article. In the plates one can only see the "business" end of the apparatus The reviewer is unaware whether it has been employed to any extent by surgeons other than its inventor, but certainly it would now be a matter of great interest to have a full description in English.

ERNEST THOMSON.

(2) **Barraquer, Ignacio.—Phakoerisis.** *Amer. Jl. of Ophthal.*, October, 1920.

(3) **Barraquer, Ignacio (Barcelona).—On phakoerisis.** Contributed to this Journal and abstracted below.

(3) **Dr. Ignacio Barraquer** has published an account of the first thousand cases of senile cataract, which he has dealt with by this method, and a detailed description of the technique which he has evolved.

He was led to the choice after becoming convinced that extraction of cataract in the capsule was the method of election. He did not find the Indian operation satisfactory, owing to the considerable force that is necessarily applied to the eye, and preferred those methods in which the lens was seized and drawn out of the eye in its capsule; yet he found that the capsule often ruptured under the stress, and the operation converted itself into an extraction through a large breach of the anterior capsule. Hence he sought an instrument which would adhere to the anterior surface of the lens with sufficient force, so that, when withdrawn, it would break the

FIG. 1.

attachment of the capsule to the suspensory ligament, and bring the lens in its grip out of the eye.

Nature had given him a lead in the suckers of a leech, or of the toes of climbing frogs, and he determined to construct an instrument which could be applied to the lens capsule and made to adhere to it, by the formation of a vacuum.

This instrument, the erisophake, is practically a small spoon, with blunt edges, on a hollow handle, which is connected with an air pump. Barraquer makes rather a large incision, nearly equal to half the circumference of the cornea, often with a conjunctival flap (Figs. 1 and 2).

He introduces the erisophake into the wound, and passes it through the pupil, which is slightly dilated with a mydriatic, to place it on the lower half of the lens. He then turns on the vacuum, which causes the spoon to adhere firmly to the lens, and by a

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

movement of the handle, rotates the lens round the horizontal axis, so that the upper edge passes through the pupil. This movement ruptures the fibres of the zonula. The lens can then be withdrawn held on the erisophake.

Barraquer says that the negative pressure of the vacuum should vary directly with the hardness of the lens, and the area of the opening of the spoon, with the softness.

His pump produces a constant vacuum which can be regulated to give rise to vibrations corresponding in amplitude and frequency to the elasticity of the crystalline lens.

He prefers to operate without iridectomy, so that adhesion of the fibres of the zonule may be averted; he has had, however, a considerable number of prolapses of iris.

He has been troubled by collapse of the cornea, and inversion of the flap, though the primary incision is not greater, he says, than that usually made; he has avoided it in his later cases, by reducing the amount of cocain given.

In the illustrations which he sends, he wishes special attention paid to the size of the flap, to the method of introducing the erisophake, and to the lever movement which is necessary to dislocate the lens. (See figures.)

Though Barraquer thinks that the simple extraction is the operation of election, only 219 of the 1000 operations were "simple"; of the remaining 781, 251 were combined extractions, and 530 extractions with small peripheral iridectomies, which we are accustomed to regard as "combined."

The tabulated results show about 70 per cent. of cases with vision of 6/9 or better, and only 3 total losses.

The first notice of Barraquer's operation is, we believe, to be found in *La Clin. Ophtal.* of 1917. A similar proceeding had been outlined by Vard Hulen in the *Jl. Amer. Med. Ass.* in 1911, but it does not appear to have gone beyond the experimental stage.* Barraquer seems to have developed the idea independently.

(4) **Barraquer, I.—On phakoerisis. (Sur la phakoérisis.)** *Annal. d'Oculist.*, November, 1920.

---

*According to a writer in the *American Journal of Ophthalmology* of October last (p. 770) Coderque, after Hulen had written, operated upon a dog. No reference is given. —EDITOR.

II.—NYSTAGMUS

Stassen, M.—I. Research on and graphic notation of the symptom "nystagmus." II. The semiological value of the symptom "nystagmus." III. The nystagmus of miners. (I. Recherche et notation graphique de symptôme "Nystagmus." II. La valeur séméiologique du symptôme "Nystagmus." III. Le nystagmus des mineurs.) *Arch. Med. belges*, Oct., Nov., Dec., 1919.

Stassen reviews the subject of nystagmus at some length in three consecutive papers which he divides as indicated by the titles. The first part deals with the work of several observers and gives details of the various schemes described for obtaining records of the ocular movements. He gives preference to the nystagmograph described by Buys (*Soc. franç. d'Ophtal.*, May, 1909), a modification of the physiological recording tambour. Several tracings are reproduced. Stassen points out that they are of two main types, undulatory and spring movement (*à ressorts*), the latter being composed of a rapid and slow phase. The former is typical of the occupational nystagmus, the latter of the vestibular. In the second part he discusses the various conditions which may give rise to nystagmus and the types of that affection. In part three he deals with the theories of the causation of miners' nystagmus. He finds that if, by suitable stimulation, a vestibular nystagmus is produced in a patient affected with the occupational form of the disease the tracing is not a mixture of the two types, but a pure vestibular one. Arguing from this observation he points out that the seat of the affection must lie in the central nervous system, but where? "Is it in the as yet hypothetical centres that control the muscular equilibrium of each eye? Is it in the complicated apparatus that assures the associated movements of both eyes (Ohm), or in the supranuclear centres of association (Sauvinaud, Fromaget)? Or the cerebellum? Must we go still higher, as far as the optic tracts and the cerebral cortex? These are questions which in the actual state of our knowledge it is very difficult to reply to categorically." Stassen favours the hypothesis of centres situated above the oculomotor nuclei, possibly even in the cerebellum, to co-ordinate the various motor innervations of each eye. He points out that miners' nystagmus is always noted only in looking up, at the beginning of the disease, and that elevation of the eyes is the weakest movement and the one for which the human eye is least adapted. Thus, "as the centres themselves are on the point of being disorganized by the abnormal action of the photo-receptive

elements (regulators of fixation), it is easy to suppose that a supplementary effort (such as a frontal direction of regard) completes the trouble and consequently brings equally difficulties in the muscular equilibrium of the eye which these centres govern."

The papers show evidence of careful study and are worth reading in the original.

E. E. H.

III.—THE OPERATIVE TREATMENT OF SUPPURATION AFTER CATARACT EXTRACTION

Stargardt, K.—The operative treatment of suppurative infection after cataract extraction. (Die operative Behandlung der eiterigen Infektionen nach Starroperationen.) *Zeitschr. f. Augenheilk.*, Bd. XLIII, Festschrift f. H. Kuhnt, 1920.

Suppuration in the time of von Graefe occurred in about 10 per cent. of the cases. To-day it is rare. It is difficult to state the exact percentage, but it lies between one and two per cent. It is a general opinion that when purulent infection is present little can be done to save the eye, which in the large majority of cases is lost. Most of the methods, both general and local, have proved futile. The best results are obtained by following out the operative methods described by Kuhnt. **Stargardt** divides these cases into three groups. Infection of the wound and cornea. Infection of the anterior chamber. Infection of the sac of the capsule, and infection of the vitreous. When the cornea is infected Kuhnt's method must be adopted. In deep anaesthesia a double pedicled conjunctival flap is cut and the wound is examined to see whether the anterior edge alone or the deeper layers of the cornea are affected. If the former, the edge is freely cut away with scissors. If the deep layers are infected the cornea is split and the soft tissue scraped out with a minute scoop. The anterior chamber is now washed out with normal saline or with oxycyanide of mercury and the wound covered with the conjunctival flap. Kuhnt has published some successes with this operation. In some the organism was a staphylococcus, in others a pneumococcus. This procedure is better than cauterization, for after this the conjunctival flap cannot be employed till all the burnt tissue has been exfoliated. Optochin and vouzin are useful in these cases, more especially when the cornea alone is infected. The anterior chamber can be infected alone or in conjunction with the cornea and the capsule sac. Isolated infection of the chamber is seen clinically under the picture of an iridocyclitis with or without hypopyon.

The best treatment is to wash out the chamber with normal saline or with a 1:5000 solution of oxycyanide of mercury. Kuhnt recommends that the chamber be drained once a day till the iris regains its correct colour. When the capsule sac is infected it must be removed with forceps, one blade behind and one in front. A case is cited in which this treatment was successful. The paper recounts several cases in which drastic treatment has saved the eye, and it is quite obvious that in these patients we ought not to sit still and do nothing. Here and there we may save an eye which would, if left alone, be hopelessly lost. The reviewer has published a case in which treatment of the nature described saved an infected eye, with good subsequent vision.

T. HARRISON BUTLER.

IV.—RETRO-BULBAR NEURITIS FROM POISONING BY BARIUM SULPHATE

Garraud and Le Roux.—Bilateral retro-bulbar optic neuritis, consecutive to the ingestion of sulphate of barium. (Névrite optique retrobulbaire bilatérale consécutive à l'ingestion de sulfate de baryum.) *Arch. d'Ophtal.*, August, 1920.

Radiologists frequently make use of sulphate of barium in the examination of the gastro-intestinal tract by X rays. By reason of its cheapness it has largely replaced the bismuth salts for this purpose. Being insoluble, it has been reported as innocuous. The authors report a case of intoxication by this salt recently observed by them. The patient, aged 70 years, was seen on March 19, 1920, suffering from slight conjunctivitis; his sight was normal, and there were no ophthalmoscopical signs of disease.

At 11 o'clock on May 12, 1920, he was given 125 grammes of sulphate of barium for a radioscopic examination of the stomach. Two hours later he found his sight was "disturbed," and he was giddy. At the same time he was attacked by severe colic and diarrhoea. At 18 o'clock, seven hours after his dose, severe vomiting ensued, lasting for half an hour. He was then seen by his ordinary medical attendant.

The failure of vision was progressive during the next three days, so that the patient was unable to read even very large print. At the end of the third day improvement in sight began and slowly continued. He was first seen by **Garraud** and **Le Roux** on May 24, twelve days after the administration of the barium salt, when they noted: Right eye—No surface inflammation; pupillary

reflexes undisturbed; no appreciable lesion in media or fundus; field of vision normal, V.=8/10. Left eye—No conjunctival congestion; pupillary reflexes present; media clear; partial decolouration of the optic pupilla, and narrowing of its arteries; no visible changes in the macular region; field of vision unrestricted; central scotoma, with slightly eccentric fixation, V.=7/10; urine normal.

June 2, vision improved; R.=9/10, L.=8/10. The central scotoma had almost disappeared.

June 14, complete recovery; R.V.=10/10, L.V.=10/10. Left optic papilla has regained the appearance of health.

The authors are not aware of any recorded case similar to theirs. They refer to one case of poisoning reported in *la Presse Médicale* of June 5, 1920, that of a man under the care of Dr. Japiot, of Lyon, who was given 200 grammes of sulphate of barium; half an hour later gastric pain, nausea, and vomiting developed, accompanied by muscular spasm, a thready pulse, and collapse. These symptoms lasted twelve hours and recovery ensued. Chemical analysis of the salt administered to this patient showed that it was free from lead, but that it contained two soluble and highly toxic salts of barium, sulphide and carbonate.

In Garraud and Le Roux's case, the barium sulphate was proved to be free from adulteration by lead, but no tests were made for other salts of barium.

These two cases show that care should be taken by those employing this preparation to ensure that "chemically pure sulphate of barium, for administration for radioscopic examination," is supplied.

J. B. LAWFORD.

V.—BACTERIAL PROPHYLAXIS OF POST-OPERATIVE INFECTION

Elschnig, Dr. Anton (Prague).—The bacterial prophylaxis of post-operative infection of the globe. (Die bakterioskopische Prophylaxe der postoperativen Infectionen des Bulbus.) *Zeitschr. f. Augenheilk.*, Bd. XLIII, Festschrift f. H. Kuhnt, 1920.

Investigations made by **Elschnig** and by other workers have proved that in the majority of cases the conjunctival sac contains pathogenic organisms. The only safe method of preventing post-operative infection is to eliminate these organisms before operation. The value of this type of prophylaxis is shown by the published work of Bernheimer who reduced his losses to 0.25 per cent. Kuhnt says

that discission of capsule is only permissible when bacterial tests have proved that the sac is free from organisms. Elschnig in over 1,500 operations lost only 25 eyes from mycotic inflammation, and this includes not only eyes enucleated, but those so severely damaged as to be useless. The methods which have enabled such splendid results to be obtained are worthy of careful study. A mixture of two parts of nutrient broth with one of sterile blood serum is prepared and a few drops are drawn into a sterile pipette. These are now blown into the conjunctival sac and well smeared about the sac with the end of the pipette. The liquid is drawn up again with the pipette and dropped back into the tube. The tube, together with a similar uninoculated tube, is incubated for from 24 to 48 hours. If at the end of 24 hours the broth shows a diffuse clouding the presence of streptococci is almost certain. A crumby clouding indicates the xerosis bacillus. Smears are stained by Gram's method and with methylene blue. In actual practice methylene blue gives all the differentiation that is necessary. If the tube remains clear the absence of organisms likely to cause trouble can be assumed.

Elschnig has made cultures after this plan before 1,500 operations for senile cataract—694 were found to be sterile, but in many cases lotions had been used before the patient was admitted, and the figure seems to the author to be too high. He has come to the opinion that it is impossible to draw a sharp distinction between streptococci and pneumococci. He has, for example, found that if a pure culture of pneumococci from a serpent ulcer is inoculated on to serum broth it is usual to grow nothing but streptococci. A few pneumococci may be present, but it is extremely rare to find pneumococci alone. In 20.5 per cent. bacteria of the streptococci group were present in the first cultures made when the patient was admitted. In another group of cases Elschnig published statistics which gave over 40 per cent. of streptococci.

The streptococci were found in four forms: pneumococci, short chains of diplococci, long chains, and double chains. It would appear that the nutrient media have much to do with the form assumed by the organisms. Staphylococci were present in about 30 per cent. of the cases. For a long time Elschnig ignored staphylococci, but he now regards them as equally dangerous with streptococci. They are just as likely to give rise to infection after cataract extractions as are the pneumococci! The smaller the cocci and the more they tend to assume the diplo form, the more they are to be feared. The colour of the colonies is no criterion of their danger. The staphylococcus albus becomes an intense yellow when grown upon gelatine. Xerosis bacilli, diplobacilli, and subtilis, are harmless and may be ignored.

The prophylactic treatment is carried out in the following manner.

The first culture is made upon the day that the patient is admitted to the hospital. Next day the tube is examined and if there is a growth the operation is postponed. The conjunctiva is treated with disinfecting drops and in two days another examination is made. The last irrigation should be made at night and the culture taken next morning before any treatment has been carried out.

If there is a discharge of pus from the lacrimal sac, this must be extirpated, or the dacryocystitis cured by Toti's operation. The best lotion is one in five thousand solution of oxycyanide of mercury. If the conjuctival sac be washed out two or three times a day with this lotion for two or three weeks it will generally become sterile. If the first culture contains streptococci, Elschnig uses a quarter per cent. solution of optochin for the sac lavage, or this may alternate with the oxycyanide. A one-half per cent. ointment of optochin is useful when pneumococci are present, and this organism is generally rapidly eliminated by the use of the oxycyanide lotion. Peroxide of hydrogen is not satisfactory. Axenfeld has shewn that these culture methods are not infallible, and Elschnig agrees that the first examination may give a sterile sac and a second may shew the presence of organisms. This is due either to a failure of the culture or to reinfection of the sac in the hospital. Either may happen. It is very necessary to be certain that the nutrient broth and serum are absolutely neutral, and to lose no time in putting the inoculated tube into the incubator. There are two chief causes for post-operative infection after operation. One is due to underestimating the danger of staphylococci. Many seem to imagine that the streptococcal group is alone responsible for the inflammations which occasionally follow operations upon the globe. Elschnig's researches prove most conclusively that staphylococci are responsible for a large proportion of these accidents. All that can be said is, that on the whole the inflammations caused by the staphylococci are less severe than those due to streptococci. The reviewer, in a paper read at the 1920 Congress of the Ophthalmological Society of the United Kingdom on the causes of infection after operations for cataract, pointed out that in several of his cases the staphylococcus albus was the only organism present, and he was of the opinion that its danger had been greatly underestimated. Elschnig has done the profession a valuable service in pointing out the danger of staphylococci, and in stating that even staphylococcus albus may be a source of failure.

T. HARRISON BUTLER.

VI.—GLAUCOMA

(1) **Gilbert, W.—Contributions to the study of glaucoma. (Beitraege zur Lehre vom Glaukom.)** *Zeitschr. f. Augenheilk.*, Bd. XLII, Festschrift f. H. Kuhnt, 1920.

(1) **Gilbert** is of the opinion that iridectomy is still the chief glaucoma operation, and the fact that the effect of all the more modern operations is compared with that of iridectomy shows that this is the case. At the present time, although there are so many alternative operations at command, yet a large number of oculists still perform iridectomy for glaucoma, just as they did in the past. This statement is only true of Germany, and shows that that country has to this extent ceased to be progressive; not one of the fistulizing operations arose in Germany, and, therefore, they are inferior. After quoting Meller, who has given up Elliot's operation for most cases, reserving it alone for those in which iridectomy is known to be dangerous, Gilbert brings forward the views of Hegner. He concludes that the good effect is not dependent upon fistulization, for there are many cases with good filtration in which the tension is not reduced, and others of the reverse order; there is no filtration, the hole is solidly healed, and yet the tension is reduced. He notes that the operation is to-day always combined with iridectomy, and he thinks that this iridectomy has much to do with the good effect of the combined operation. Trephining will never replace iridectomy, but it has its place, and this is chiefly in cases with very high tension, and advanced inflammatory forms of glaucoma. After these preliminary remarks regarding the comparative value of trephining and iridectomy, Gilbert goes on to discuss three points which are of value in deciding between the operative or conservative treatment of the disease. They are: operation and age, operation and the vascular system, and operation and the field of vision.

Although conservative treatment is doubtless responsible for many blind eyes, yet, on the other hand, not a few have been destroyed by operation. It is necessary to weigh most carefully all the factors, both general and local, before deciding upon a course of action.

Operation with reference to age.—The author thinks that cases of glaucoma simplex over sixty years of age should not be submitted to operation, and he gives instances of miotic treatment which have proved successful. He operates under sixty because the high pressure will have longer to act upon the eye, and will injure it. Of course, this advice refers to iridectomy, which is the operation employed by him for these cases. Were he to study the statistics which have been published in England, in France and in America,

he might realize that iridectomy is successful in, at most, 40 per cent. of the cases, and for this reason has been more or less completely abandoned in favour of some form of sclerotomy, which affords a percentage of success more or less in the region of 80 per cent. A comparison of these results with those of conservative treatment would lead to a different conclusion from that given by a balance between iridectomy and pilocarpin. The idea, too, that long years are necessary for glaucoma simplex to effect its deadly work, and that therefore, in the case of a patient aged 60, it may be allowed to go on merely checked by eserin, is futile, for many cases of glaucoma are blind in a year or two. Healthy age should be no bar to an operation for a glaucoma which is palpably advancing in spite of miotic treatment.

Operation with reference to the vascular system.—This is an important factor. Hegner points out that it is wise to treat cases with eserin, and to wait for the acute stage to pass off. Gilbert thinks that it is a good thing to bleed patients before operation, and he is supported by Dyes, Elschnig, and Kuhnt. A history of slight hemiplegic attacks should warn against operation and suggest miotic treatment. Small retinal haemorrhages, and the presence of arterial sclerosis and albuminuria are all indications for miotics rather than for operation.

Operation and method of operation with reference to the field of vision.—Van der Hoeve, an adherent of iridectomy in non-inflammatory glaucoma, rejects this operation when the field of vision is small on the nasal side, or when central scotomata encroach near the fixation spot. He cannot give any reason for the bad effect of iridectomy in such cases, but he is of the opinion that the size of the iridectomy is not without influence. Gilbert has seen the field contract to the fixation spot after both large and small iridectomies, whether total or peripheral. Meller records loss of central vision after a small peripheral iridectomy, whereas Lagrange says that peripheral iridectomy is absolutely harmless. All these unfortunate cases have one thing in common, the loss of function runs parallel with the reduction of tension. Cases have been recorded, after trephining, after Lagrange's operation, and following cyclodialysis. Not a few cases are on record in which the field of vision steadily contracted although the tension had been reduced to normal or below normal by operation. Gilbert thinks that the alteration in tension may, in some cases, dispose to cavernous degeneration of the optic nerve. The paper is worthy of study, but in common with many others in German literature, leaves the impression that some ophthalmologists in Germany are not well informed upon the contemporary literature which appears in languages other than German.

T. HARRISON BUTLER.

(2) **Asmus, A.—For and against Elliot. (Für und wider Elliot.)** *Zeitschr. f. Augenheilk.*, Bd. XLIII. Festschrift f. H. Kuhnt, 1920.

(2) **Asmus** describes the delight with which Elliot's operation was at first received, especially after Stock's favourable account of it in 1912 had helped to popularize the method. At this time many surgeons employed the trephine even in cases of acute glaucoma. Then came disillusionment: case after case of late infection was recorded, and many of those who had been the most enthusiastic returned to older methods. The author gives the opinions of many eminent German ophthalmologists, and it is obvious that the majority now regard the trephining operation as too risky because of this liability to late infection, and have either returned to iridectomy or perform an alternative operation such as cyclodialysis. Axenfeld, Meller, and Haab, are among those who have abandoned the operation; whereas Fleischer of Tuebingen praises it highly.

Asmus gives an analysis of his own 40 cases arranged in tabular form. Among these there is one case of late infection which appeared three months after the operation, and fortunately cleared up without affecting the vision. Eighty per cent. of the forty were successful, the tension was reduced to normal. He comes to the conclusion that the results of the operation are so good that we must not condemn it because of the risk of late infection, but must seek to avoid this complication. He suggests that it might be wise for trephined persons to wear goggles to protect the eyes.

T. HARRISON BUTLER.

(3) **Emil v. Grosz.—On trephining in glaucoma. (Ueber die Trepanation bei Glaukom.)** *Zeitschr. f. Augenheilk.*, Bd. XLIII. Festschrift f. H. Kuhnt, 1920.

(3) **von Grosz** has in the years 1913 to 1919 performed 1,152 operations for glaucoma at the University Eye Clinic at Buda Pesth. Elliot's operation was performed 401 times. For chronic inflammatory glaucoma 163 times. For absolute glaucoma 139 times. For glaucoma simplex 99 times. The large number of cases of absolute glaucoma is due to the fact that the patients are drawn from the whole of Hungary, and very many do not undertake the journey till the disease is far advanced. In spite of the fact that the government has established provincial ophthalmic centres, the people prefer to trust themselves to Pesth. For the same reason it is difficult to get any accurate statistics of the final results, for most of the patients return whence they came and are no more seen. Late infection was infrequent; one patient developed sympathetic ophthalmitis but the eye was saved. In 29 cases of glaucoma simplex which were examined after some time, 10 showed diminished acuity, 38 per cent. Choroidal haemorrhage

was rare but posterior synechiae frequent. Twenty per cent. of subacute cases showed loss of visual acuity. von Grosz sees no reason to alter the opinion he expressed at the London Congress in 1913. Iridectomy will in the future be the general operation, and the earlier the case the more suitable is it for this operation. Glaucoma inflammatorium chronicum with clear media and contracted field may be trephined. In cases of glaucoma simplex the author will no longer trephine but perform Lagrange's sclerectomy. Sclerectomy is also the correct procedure in the early stages of juvenile glaucoma. In advanced cases no operation is of any avail. Enucleation is best in absolute glaucoma.

T. HARRISON BUTLER.

(4) **Schürhoff.—The operative treatment of glaucoma in the Kiel Eye Clinic. (Die operative Behandlung des Glaukoms an der Kieler Augenklinik.)** *Klin. Monatsbl. f. Augenheilk.*, October-November, 1919.

(4) **Schürhoff,** Assistant in the Kiel Ophthalmic Clinic, states that during the past twelve years 437 operations have been performed for glaucoma. The methods employed were the following: Cyclodialysis, 259 times; iridectomy, 155; sclerotomy (de Wecker), 20; trephining, 2; irido-sclerotomy (Lagrange), 1. The last two methods were not repeated because of the unfavourable results obtained. One trephining operation had no effect for good or evil. The second trephining and the single Lagrange were accompanied by loss of vitreous, and the eyes becoming infected were removed. It was surely premature to condemn and abandon an operation after two trials and one trial respectively. Loss of vitreous is very rare during trephining, and infection still less frequent. The results obtained by cyclodialysis were: no result, 18; bad result, 2; transient result, 28; good result, 97; permanently good result, 46. The corresponding figures for iridectomy were 22, 3, 17, 67, 2. It was constantly noted that when iridectomy failed single or repeated cyclodialysis succeeded, but that when cyclodialysis did not reduce the tension, iridectomy was equally ineffective. The author concludes that cyclodialysis is at least as efficient as iridectomy. No exact comparison can be made because the indications for the two operations are not the same. For example, cyclodialysis would rarely be chosen in acute glaucoma of recent date. It is, however, unusual in Kiel for a case to be seen at once; generally the acute attack has reached a chronic stage, and then cyclodialysis is better than iridectomy. This view confirms the opinion held by many English operators: that when an acute glaucoma has been in evidence for some weeks, then sclerectomy is a better operation than iridectomy. It is quite impossible to analyse or criticize the paper, because no attempt has

been made to classify the nature of the glaucoma. The figures include primary and secondary glaucoma, simple, congestive, acute, and sub-acute. Treatment suitable for one might not be ideal for another type. The paper is, we fear, but special pleading for cyclodialysis, the favourite operation at Kiel. The figures give no indication of the comparative value of cyclodialysis and a modern sclerectomy operation in simple glaucoma, for trephining was never really tried. Two operations were performed, and no operator can fairly judge a surgical procedure till he has mastered its technique, nor can he hope to become competent after two attempts.

T. HARRISON BUTLER.

(5) **Knapp, Arnold (New York).—Hypotony after trephining.** *Amer. Jl. of Ophthal.*, 1920.

(5) **Knapp** gives an abstract of four cases in which hypotony followed trephining for glaucoma. He is of opinion that too free filtration is injurious and leads to changes in the intra-ocular circulation. He does not agree with Elliot in the view that artificially produced hypotony is not necessarily of pathogenic significance. It should be our aim to obtain just enough filtration to keep down glaucomatous tension, and Knapp advocates a small trephine cleanly removing the entire segment. In three of his cases, choroidal detachment was observed.

J. HAMILTON MCILROY.

VII.—THE AETIOLOGY OF MYOPIA

Ochi, S. (Kyushu, Japan).—Relation of the ocular muscles and sclera in the aetiology of myopia. *Amer. Jl. of Ophthal.*, September, 1919.

Ochi performed a series of compression experiments on the eyeball of the young rabbit, and gives his views upon the general factors that are concerned in myopia.

His first set of experiments was directed to the discovery of the part played by the ocular muscles in causing compression of the sclera, or alteration in the diameters of the eyeball. He experimented on forty-one young rabbits, inserting wedges of absorbent cotton either between the muscle and the eyeball, or between the muscle and the orbital wall, according to the condition of the muscle in question—some of the muscles being too delicate to stand the

former manipulation. The fellow eye in each case was taken as control.

Examination of the nine rabbits which survived, at the end of six months, gave, out of three cases in which the wedge had been inserted at the upper side of the eyeball, a slight decrease in the vertical diameter of the experimental eye in two cases, and no change in the other case; a slight increase in the transverse diameter in the three cases; and a slight increase in the antero-posterior diameter in two cases, with no change in the third case. (2) In the cases in which the wedge had been inserted at the lower side, the vertical diameter showed a slight decrease, and the other diameters showed no change. (3) The other cases showed no change.

These results being inconclusive, he decided to exert greater compression upon the eyeball, and his second series of experiments consisted in binding the equator of the eyeball with a silk thread instead of inserting the wedges. Six young rabbits were used, and three of these survived at the end of six months. Myopia varying from 7 D. to 10 D. was found in these experimental eyes. On enucleation the binding threads were found to be broken. Measurements showed the vertical diameter of the experimental eye to be either slightly decreased or unchanged; the transverse and antero-posterior diameters were slightly increased.

From these experiments he concludes that pretty strong compression on the eyeball does not greatly lengthen the diameter of the globe, and he argues that pressure of the muscles alone cannot effect much alteration in the antero-posterior diameter, provided the resistance of the walls of the eyeball be strong. He believes that the muscles alone could exert this lengthening influence if the sclera were weaker than normal, and he ascribes the development of juvenile progressive myopia to the pressure of the muscles on an eyeball which has a weak sclerotic envelope.

He considers the sclera to be developmentally part of the cranium, the cartilaginous layer in the lower vertebrates being a direct prolongation of the skull wall—the eye starting as the primary optic vesicle in the embryo, and the sclera developing around this in the same way as the cranium around the brain matter. He looks upon the sclera as the supporting structure for the soft eye-parts, and does not consider the bony wall of the orbit as intrinsically connected with the eye.

Ochi passes from this to the consideration that in the case of children of scrofulous habit, whose skeletons are weak in respect to rigidity, one may expect to find inadequate support on the part of the scleral tissue.

He concludes by urging the prophylactic treatment of myopia on lines which are directed towards the improvement of the general

health of the individual. For strengthening the skeleton and sclera he recommends proper sports, and emphasises the principle of *safeguarding the young growing* eye against exhaustion in the same way that one protects the child from overstrain during the early *years of school life.*

J. HAMILTON MCILROY.

VIII.—THE SURGICAL TREATMENT OF BENIGN *INTRADURAL TUMOURS OF THE OPTIC NERVE*

Golovine, S. S. (Moscow). — Benign intradural tumours of *the optic nerve* and their surgical treatment (subvaginal extirpation). (Tumeurs intradurales bénignes du nerf *optique et leur traitement* chirurgical [extirpation sous-vaginale]). *Arch. d Ophtal.*, Nov.-Dec., 1918.

In a long and suggestive paper based on an unusually large experience of cases, **Golovine** advances the opinion he has formed concerning benign intradural tumours of the optic nerve, and describes a method of operating which, planned on theoretical grounds, he has employed in the three cases now reported. He has had nine cases of this kind under his own care; five were published in 1904 in the *Westnik Ophtal.*; one in the same journal in 1909.

After noting that out of a somewhat chaotic arrangement of tumours of the optic nerve, two large groups of extradural and intradural tumours have emerged, he expresses the opinion that among the intradural variety a relatively large number have the characters of an inflammatory hyperplasia, and are, in a surgical sense, benign. These tumours are not dangerous to life except from mechanical invasion of the central nervous system, to which they seldom show any tendency.

It is very important that the collected experience of observers should be utilized in an attempt to determine the symptoms by which benign intradural tumours may be diagnosed clinically, and this diagnosis confirmed on the operating table. The doubt as to the malignancy of intradural tumours engendered by microscopic examination is confirmed by analysis of clinical data.

Two facts of great importance will be obvious to anyone who studies the clinical records, both old and new, without preconceived ideas: (1) No instance is reported of penetration of the eyeball by an intradural tumour; yet such an invasion by tumours belonging to the sarcoma group would be expected. (2) Intradural tumours, even of long duration, do not destroy the dural nerve sheath and

do not fill the orbital cavity as do malignant neoplasms from whatever part of the orbital tissues they may arise.

Another important fact is the result of surgical experience; the surgeon after dividing the tumour at its proximal end usually finds evidence that a portion of the growth has been left in or close to the optic canal, sufficient to be the starting point of a recurrence. Nevertheless, a recurrence is exceptional, and a fatal termination soon after operation, which has happened but rarely, has been due to intracranial disease in existence before intervention.

Golovine assumes that surgeons generally have abandoned operations which included removal of the eyeball, and have adopted procedures based on Krönlein's operation whereby the temporal wall of the orbit is resected, and the optic nerve and tumour removed, leaving the eyeball *in situ*. While fully agreeing with this method of exposing the tumour, he enquires (1) What are the disadvantages of extirpation of the tumour and optic nerve in its entirety, and what reasons are there for desiring to avoid this operation. (2) Is it possible to recognize the variety of tumour in which it is permissible to avoid resection of the optic nerve?

The author's objections to removal of the optic nerve and growth are the resulting paralysis of the levator palpebrae (13 times in 36 cases, Heilbron), and paralysis of the recti muscles, the abducens being most frequently affected. Heilbron's figures are: internal rectus, 9; superior, 13; inferior, 11; and external, 17 times. Retraction of the eyeball and occasional neuropathic keratitis are other objections.

Method of operating.—Sub-vaginal extirpation of benign tumours of the optic nerve.

Golovine's method of exposing the orbital contents differs in several details from that originally adopted by Krönlein. The skin incision is forked; the upper arm, in the eyebrow, extends along the superior orbital margin, from a point slightly internal to the mid-point, to the outer angle; the lower arm of equal length runs along the lower rim of the orbit; these incisions converge to a point about half a centimetre outside the external angle of the orbit (see diagram in the *Archives*).

The outer margin of the orbit is exposed and the ligament and the tarso-orbital fascia is divided close to the bone, admitting of free digital exploration of the orbit. Resection of the outer wall of the orbit is effected without preliminary separation of the periosteum, as advised by Krönlein. The external rectus muscle is *not* divided. At the conclusion of the operation the eyelids are stitched together as a temporary measure for protection of the cornea in the event of swelling of the orbital tissues.

The real novelty in the author's procedure concerns the removal

of the new growth. He exposes it by the separation of the external and superior recti, makes an anteroposterior incision through the dural sheath and removes the tumour mass by scraping it away with a sharp curette. The optic nerve is left in position. A small drain, usually removed on the third day, is introduced into the opening in the sheath and the external wounds are closed.

Golovine narrates three cases in which he operated in this manner, and gives full clinical details. Two were in adult males, one in a female child. All the cases did well surgically, healing being uncomplicated, and in cases 1 and 2 the cosmetic results were very satisfactory, as evidenced by photos of the patients after operation. The subsequent history is important. In case 1 (male) there was no sign of recurrence two years later and the ocular movements were full, except abduction which was slightly limited. In case 2 (child) no further trouble had arisen three and a half years after operation. In case 3 (male) the result was not so happy; one year after operation the eyeball again became proptosed and other signs of a recurrent growth became manifest and a second operation was undertaken. Microscopic examination of the recurrent growth revealed the characteristics of a sarcoma.

While the first two cases support the author's opinion that benign intradural tumours can be dealt with, as he suggests, without removal of the optic nerve and with permanently good results, it is obvious that in the presence of a malignant tumour his method is not only unsuitable, but probably affords less likelihood of complete cure than more radical procedures.

In his notes of his third case Golovine notes that the appearance of the tumour and the thinness of its capsule led him to doubt if he was dealing with a primary intradural neoplasm.

The clinical diagnosis as to the benign or malignant nature of an optic nerve tumour is so nearly impossible that the procedure advocated by Golovine might well be considered as a preliminary measure to be followed by removal of the orbital contents if the pathologist pronounces the growth to be malignant.

A useful list of references to the literature of the subject is appended.

J. B. LAWFORD.

CORRESPONDENCE

AN EXPLANATION

To the Editor THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—A surgical instrument factory, of Freiburg (Germany), has just sent me a prospectus, quoting highly flattering remarks, signed Professor Dr. Landolt.

I sincerely hope that none of my colleagues who have received the same prospectus will confuse my name with that of this Professor Doctor.

Yours, etc.,

PARIS, *Nov.* 30, 1920. Dr. EDMUND LANDOLT.

BOOK NOTICES

Fatigue of the Visual Apparatus in Miners. (La Fatigue de l'Appareil Visuel chez les Ouvriers Mineurs.) By Dr. M. STASSEN. Liège: Imprimerie H. Vaillant-Carmanne, Place Saint-Michel, 4. 1914-1919.

This book is the result of a close practical study of coal miners' nystagmus which the author has made over a number of years, interrupted only by the war.

In order to become thoroughly familiar with the condition under which work in metalliferous as well as coal mines is carried on, Stassen has frequently worked underground himself, and, in addition to this, he has had the advantage of an association with such an authority on the subject as Nuël; it is, then, not surprising that the result is a contribution to the present knowledge of coal miners' nystagmus which no one interested should be without.

Perhaps the most attractive portion of the book is that dealing with the pathogeny of the disease, a clue to which is found in the title, namely "Fatigue of the Visual Apparatus in Miners," for Stassen regards the nystagmic condition as essentially one of excessive fatigue.

To explain this theory, the physiology of vision, according to Nuël, is put forward at some length, thus: "The visual organ, like other sense organs, can be regarded as an *ensemble* of neurons through which the transformation of impressions into movement is effected.

"Apparently, the most voluntary of our visual movements must

be regarded as consequences of physiological, i.e., physical processes and not excited by conscious states.

"In man these physiological processes are undoubtedly accompanied by conscious phenomena, light sensations, etc., but these sensations are not the exciting causes of the movements observed, they result from nervous, i.e., physical processes of which sensation is a psychic epiphenomenon."

On this principle, the author regards all the motor phenomena of which the visual apparatus of miners is the seat, as reflex processes. The point of origin, and consequently the centripetal route of these reflexes, may be very variable. Most frequently it happens to be luminous, vibrations striking the photo-receptor organ (retina) and causing there a physiological process, a movement or a molecular kinesis which Nuël has called "photo-reception."

In its turn photo-reception provokes in the optic nerve a further molecular kinesis which is propagated to certain central nerve-cells (probably modified) and thence by centrifugal nerve-fibres to muscles, glands, etc., where the kinesis is translated into a mass movement of the body as a whole, or of parts of the body (movement of the head, arms, eyes) or even a chemical movement (secretion).

These final movements, provoked remotely, which follow a photo-reception may be designated "photo-reaction."

Photo-reaction may be of two kinds: (1) Somatic (on the body or parts of the body), placing us in direct communication with the outer world. These are the true photo-reactions which exist in the lower animals to the exclusion of all others as reactions of attack or defence and which must be regarded as the physiological aim, the *raison d'être* of photo-receptions. (2) Ocular photo-reactions (on the eyes) are met with in man and in those animals which possess a motor system of the globes. It is to the question of ocular photo-reactions that the author more especially directs attention, for it is these which are chiefly involved in underground work.

The reflexes which concern the eye and arise from it he speaks of as "oculo-ocular reflexes." They are of two kinds: (*a*) The visual reflexes; (*b*) The reflexes of protection of the visual apparatus; (*a*) are those of lateral regard, convergence, and divergence, whilst (*b*) are the palpebral, pigmentary, pupillary, Meibomian, ciliary, lacrimal secretory, and vaso-motor-reflexes.

In addition there are other ocular movements which are originated, not in the visual apparatus itself, but elsewhere, thus: labyrinthine excitation (sense of equilibrium) can reflexly determine ocular movements (ocular stato-reactions or labyrinthine nystagmus).

This equilibrium is achieved provided that the external agent does not make its influence felt for too long a time or too frequently.

On the contrary, if its action persists or is repeated the disturbances in the working of the visual reflexes increase in intensity, and at

once the whole apparatus is deranged. This is, according to the author, just what occurs in miners and especially in coal-miners. In these workers the visual reflexes are submitted to violent and repeated shocks and efforts, for, even at the moment of descent into the mine, the rapid change of lighting and the increase in pressure place the mesocephalic co-ordinations of the ocular movements of the globe in unstable equilibrium.

The efforts of vision (accommodation, fixation, etc.) required by work in bad conditions of lighting are followed by disturbance of the function of these nerve centres.

The centripetal influences, visual, labyrinthine, static, etc. (photo- and stato-receptions), which provoke in daylight the normal action of the reflexes over which these centres preside are completely changed and at once give rise to phenomena of exaggerated fatigue, especially in individuals who are predisposed and who present a special fragility of these centres.

The fatigue which work in bad conditions of lighting imposes on the visual apparatus engenders morbid phenomena which together make up a nerve syndrome characterised by incoordination and the exaggeration of nervous reflexes.

The clinical symptoms of this syndrome may vary from one subject to another, but all bear the imprint of biological troubles provoked by accumulation of fatigue. The ocular oscillations of miners are really only the clinical manifestations of fatigue in the execution of ocular movements.

This gives an outline of the author's views on the pathogeny of the disease.

The first chapter is devoted to a historical survey, other chapters to statistical research, the physiological conditions of the miner's work, and a very fair description of the various forms in which the trouble may exist, with illustrative cases, etc.

With regard to treatment but little is said, as may be imagined; mention is made, however, of psychotherapy "even institutional treatment," and with the latter the reviewer is in accord. It must indeed have occurred to all who see these cases that the worst, at least, might be considerably benefited by admission into an institution somewhat on the lines of a shell-shock hospital, for nothing could be worse than the present method of leaving cases to their own devices.

BERNARD CRIDLAND.

Surgical treatment of Convergent Squint in the adult. (Tratamiento quirurgica del estrabismo Convergente en el adulto.) By Dr. ZAMORA. Valladolid. 1920.

This little brochure is the author's thesis for the degree of M.D. in the University of Madrid. Squint, as is well known, is very common in Spain, and in this work the ground is fairly covered;

the different methods of attacking the problem, with the advantages and drawbacks of each, are clearly described. Numerous illustrations of patients before and after operation, with a short *résumé* of the clinical history and the type of operation performed in each case, twenty-nine in all, form a useful appendix, while a bibliography is also appended; the only English authors mentioned in the latter being George Critchett and Sydney Stephenson; the work of Worth does not appear to have penetrated as far as Spain.

R. R. JAMES.

NOTES

Obituary.

THE death of Sir William de Wiveleslie Abney, K.C.B., F.R.S., occurred on December 3rd, at the age of 76. He entered the Royal Engineers at the age of 17, retiring in 1881 with the rank of Captain. He was elected a Fellow of the Royal Society in 1876, and was awarded the Rumford Medal in 1882 for his researches on radiation. He was a pioneer in the chemistry of photography, and wrote the first practical treatise on the manufacture of sensitive emulsions. In 1882 he delivered the Cantor Lectures of the Royal Society of Arts, choosing as his subject, "Recent Advances in Photography." He was also a pioneer in the three-colour process. In addition to being President of the Royal Photographic Society, he also served as President of the Royal Astronomical and the Physical Societies. Sir William Abney was appointed Assistant Director for Science in the Science and Art Department of South Kensington in 1884, Director in 1893, and Assistant Secretary in 1899. In 1900 he was appointed Assistant Secretary to the Board of Education, and in 1903, scientific adviser to the Board. He was made C.B. in 1888, and K.C.B. in 1909.

Sir William Abney's work on Colour Vision is his chief claim to recognition by ophthalmologists. In 1892 he gave a lecture at the Royal Society of Arts on "Colour Blindness." In 1894 he delivered the Tyndall Lectures at the Royal Institution on "Colour Vision." His original papers in the Transactions and Proceedings of the Royal Society are known to opthalmologists. His researches were gathered together, and rendered more generally accessible in a volume entitled "Researches in Colour Vision and the Trichromatic Theory" in 1913. Sir William Abney carried on the tradition of Thomas Young, Clerk Maxwell, and Helmholtz, and added greatly to our knowledge of colour vision by researches inspired by the three components theory. Like his predecessors in this field he

viewed the subject from the point of view of the pure physicist, and the mathematical trend of his papers, combined, it must be admitted, with an unfortunate obscurity of style, failed to gain for his work the recognition by physiologists and ophthalmologists which it deserved. He acted as Secretary of the Royal Society Committee on Colour Vision, appointed in 1890, and was the principal special examiner in Colour Vision for the Mercantile Marine Department of the Board of Trade from 1893 to the time of his death.

* * * *

Moorfield's Annual Dinner.

THE Annual Dinner of Past and Present Students of the Royal London Ophthalmic Hospital, will be held at the Café Royal, Regent Street, on Thursday, February 10, 1921. Chairman, Mr. J. B. Lawford, Esq., Consulting Surgeon to the Hospital. Further particulars will be announced later.

* * * *

Appointment.

DR. J. GONIN has been appointed Professor of Clinical Ophthalmology in the University of Lausanne in succession to the late Professor Eperon.

* * * *

Ophthalmological Society of Egypt

THE Annual Meeting of the Ophthalmological Society of Egypt will take place at the School of Medicine, Cairo, on March 4, 1921. Officers of the Army who are interested in ophthalmology are invited to attend. Any officer desirous of making a communication at the meeting should send a résumé of his paper not later than first post on February 15, 1921, to the Honorary Secretary, the Ophthalmological Society of Egypt, c/o Department of Public Health, Cairo.

* * * *

Sheringham Daylight Apparatus

AT the meeting of the Illuminating Engineering Society, held on December 14, Major Adrian Klein exhibited and described the latest form of Sheringham daylight apparatus, which was first exhibited before the Society at the opening meeting in 1919. It will be recalled that this unit employs a gas-filled lamp the light from which is directed upwards to a reflector carrying a special pattern in red, green and blue, the colours being so proportioned that the reflected light bears a close resemblance to normal daylight. The design of this lighting unit has now been standarized in a practical form, and it was mentioned that a form of small portable unit is now in course of preparation.